

WHAT IS CLAIMED IS:

1 A method of manufacturing a modified atmosphere package, comprising:

5 supplying a first package including a non-barrier portion substantially permeable to oxygen;

 placing a retail cut of raw meat within the first package;

 sealing the first package;

 supplying a second package substantially impermeable to oxygen;

 covering the first package with the second package without sealing the second

10 package so as to create a pocket between the first and second packages;

 supplying a mixture of gases into the pocket, the gas mixture comprising from about 0.1 to about 0.8 vol.% carbon monoxide and at least one other gas to form a low oxygen environment so as to form carboxymyoglobin on a surface of the raw meat;

15 removing oxygen from the pocket so as to sufficiently reduce an oxygen level therein so as to inhibit or prevent the formation of metmyoglobin on the surface of the raw meat; and

 sealing the second package.

20 2. The method of claim 1 further including supplying an oxygen scavenger.

25 3. The method of claim 1 further including supplying an oxygen scavenger, activating the oxygen scavenger with an oxygen scavenger accelerator, and positioning the oxygen scavenger external to the first package such that the oxygen scavenger is capable of absorbing oxygen within the pocket, the activated oxygen scavenger aggressively absorbing any residual oxygen in the modified atmosphere package.

30 4. The method of claim 3, wherein the activated oxygen scavenger reduces the oxygen level within the modified atmosphere package to approximately zero

percent in less than about 24 hours

5. The method of claim 1, wherein the oxygen level of the pocket is less than 1,000 ppm.

5

6. The method of claim 5, wherein the oxygen level of the pocket is less than about 500 ppm.

7. The method of claim 1, wherein the step of removing oxygen from the
10 pocket includes evacuating the pocket.

8. The method of claim 1, wherein the step of removing oxygen from the pocket includes flushing the pocket with the gas mixture.

15 9. The method of claim 1, wherein the gas mixture further comprises nitrogen, carbon dioxide or the combination thereof.

10. The method of claim 1, wherein the gas mixture further consists essentially of nitrogen, carbon dioxide or the combination thereof.

20

11. The method of claim 1, wherein the gas mixture consists essentially of from about 0.1 to about 0.8 vol. % carbon monoxide, from about 40 to about 80 vol.% nitrogen and from about 20 to about 60 vol.% carbon dioxide.

25

12. The method of claim 1, wherein the gas mixture consists of from about 0.1 to about 0.8 vol.% carbon monoxide with the remainder carbon dioxide.

13. The method of claim 1 further including removing the second package from the first package before retailing.

30

14. The method of claim 1 further including removing the second package

from the first package so as to allow the raw meat to be exposed to ambient atmosphere, the raw meat having color degradation similar to a fresh cut of the same raw meat.

5 15. The method of claim 1, wherein the second package is adapted to be removable from at least a portion of the first package without destroying the first package.

10 16. The method of claim 1 further including placing the retail cut of raw meat on a foam tray.

17. The method of claim 1, wherein the non-barrier portion comprises a polyolefin or a polyvinyl chloride overwrap.

15 18. The method of claim 1, wherein the gas mixture is supplied to the pocket such that the oxymyoglobin substantially converts directly to carboxymyoglobin.

20 19. The method of claim 1, wherein the oxymyoglobin substantially converts to deoxymyoglobin before the gas mixture is supplied to the pocket so as to convert deoxymyoglobin directly to carboxymyoglobin.

25 20. The method of claim 1, wherein the gas mixture comprises from about 0.3 to about 0.5 vol.% carbon monoxide.

21. The method of claim 1, wherein the gas mixture comprises from about 0.1 to about 0.5 vol.% carbon monoxide.

30 22. A method of manufacturing a modified atmosphere package, comprising:

 supplying a first package including a non-barrier portion substantially

permeable to oxygen;

placing a retail cut of raw meat within the first package;

sealing the first package;

supplying a second package substantially impermeable to oxygen;

5 covering the first package with the second package without sealing the second package so as to create a pocket between the first and second packages,

supplying a mixture of gases into the pocket, the gas mixture comprising from about 0.1 to about 0.8 vol.% carbon monoxide and at least one other gas to form a low oxygen environment, the gas mixture being supplied so as to substantially convert the oxymyoglobin directly to carboxymyoglobin on a surface of the raw meat;

10 removing oxygen from the pocket so as to reduce an oxygen level sufficiently therein so as to inhibit or prevent the formation of metmyoglobin on the surface of the raw meat; and

15 sealing the second package.

23. The method of claim 22 further including supplying an oxygen scavenger.

20 24. The method of claim 22 further including supplying an oxygen scavenger, activating the oxygen scavenger with an oxygen scavenger accelerator, and positioning the oxygen scavenger external to the first package such that the oxygen scavenger is capable of absorbing oxygen within the pocket, the activated oxygen scavenger aggressively absorbing any residual oxygen in the modified atmosphere package.

25. The method of claim 22, wherein the oxygen level of the pocket is less than 1,000 ppm.

30 26. The method of claim 25, wherein the oxygen level of the pocket is less than about 500 ppm.

27. The method of claim 22, wherein the step of removing oxygen from the pocket includes evacuating the pocket.

5 28. The method of claim 22, wherein the step of removing oxygen from the pocket includes flushing the pocket with the gas mixture.

10 29. The method of claim 22, wherein the gas mixture further comprises nitrogen, carbon dioxide or the combination thereof.

30. The method of claim 22, wherein the gas mixture consists essentially of from about 0.1 to about 0.8 vol.% carbon monoxide, from about 40 to about 80 vol.% nitrogen and from about 20 to about 60 vol.% carbon dioxide.

15 31. The method of claim 22, wherein the gas mixture consists of from about 0.1 to about 0.8 vol.% carbon monoxide with the remainder carbon dioxide.

32. The method of claim 22 further including removing the second package from the first package before retailing.

20 33. The method of claim 22 further including removing the second package from the first package so as to allow the raw meat to be exposed to ambient atmosphere, the raw meat having color degradation similar to a fresh cut of the same raw meat.

25 34. The method of claim 22, wherein the second package is adapted to be removable from at least a portion of the first package without destroying the first package.

30 35. The method of claim 22 further including placing the retail cut of raw meat on a foam tray and the non-barrier portion comprises a polyolefin or a polyvinyl

chloride overwrap

36. The method of claim 22, wherein the gas mixture comprises from about 0.3 to about 0.5 vol.% carbon monoxide.

5

37. The method of claim 22, wherein the gas mixture comprises from about 0.1 to about 0.5 vol.% carbon monoxide.

38. A method of manufacturing a modified atmosphere package,
10 comprising:

supplying a package, a first layer having at least a portion being substantially permeable to oxygen and a second layer being substantially impermeable to oxygen;

15 placing a retail cut of raw meat within the package;

supplying a mixture of gases within the package, the gas mixture comprising from about 0.1 to about 0.8 vol.% carbon monoxide and at least one other gas to form a low oxygen environment so as to form carboxymyoglobin on a surface of the raw meat;

20 removing oxygen within the package so as to sufficiently reduce an oxygen level therein so as to inhibit or prevent the formation of metmyoglobin on the surface of the raw meat;

sealing the first layer to the package; and

sealing the second layer to at least one of the package and the first layer.

25

39. The method of claim 38, wherein a pocket is formed between the first layer and the second layer.

40. The method of claim 38, wherein the second layer is at least sealed to the first layer and the second layer is adapted to be peelable from the first layer.

30

41. The method of claim 38, wherein the package includes a bottom wall, a

continuous side wall, and a continuous rim, the continuous side wall encompassing the bottom wall and extending upwardly and outwardly from the bottom wall, the continuous rim encompassing an upper edge of the continuous side wall and projecting generally laterally outwardly therefrom.

5

42. The method of claim 38 further including the step of removing the second layer.

10

43. The method of claim 38 further including supplying an oxygen scavenger.

44. The method of claim 38, wherein the oxygen level in the package is less than 1,000 ppm.

15

45. The method of claim 38, wherein the oxygen level in the package is less than about 500 ppm.

46. The method of claim 38, wherein the step of removing oxygen from the package includes evacuating the package.

20

47. The method of claim 38, wherein the step of removing oxygen from the package includes flushing the package with the gas mixture.

25

48. The method of claim 38, wherein the gas mixture further comprises nitrogen, carbon dioxide or the combination thereof.

49. The method of claim 38, wherein the gas mixture consists essentially of from about 0.1 to about 0.8 vol.% carbon monoxide, from about 40 to about 80 vol % nitrogen and from about 20 to about 60 vol.% carbon dioxide.

30

50. The method of claim 38, wherein the gas mixture consists of from about

0.1 vol.% to about 0.6 vol.% carbon monoxide with the remainder carbon dioxide

51. The method of claim 38 further including placing the retail cut of raw meat on a foam tray.

52. The method of claim 38, wherein the non-barrier portion comprises a polyolefin or a polyvinyl chloride overwrap.

53. The method of claim 38, wherein the gas mixture is supplied to the package such that the oxymyoglobin substantially converts directly to carboxymyoglobin.

54. The method of claim 38, wherein the oxymyoglobin substantially converts to deoxymyoglobin before the gas mixture is supplied to the package so as to convert deoxymyoglobin directly to carboxymyoglobin.

55. The method of claim 38, wherein the gas mixture comprises from about 0.3 to about 0.5 vol.% carbon monoxide.

56. The method of claim 38, wherein the gas mixture comprises from about 0.1 to about 0.5 vol.% carbon monoxide.

57. A modified atmosphere package, comprising:

25 a first package comprising a non-barrier portion substantially permeable to oxygen, the first package being configured and sized to fully enclose a retail cut of raw meat; and

30 a second package being substantially impermeable to oxygen, the second package adapted to cover the first package so as to create a pocket between the first and second packages, the pocket having a mixture of gases comprising from about 0.1 to about 0.8 vol.% carbon monoxide and at least one other gas to form a low oxygen environment so as to form carboxymyoglobin on a surface of the raw meat.

58. The package of claim 57 further including an oxygen scavenger.

59. The package of claim 57 further including an activated oxygen
5 scavenger.

60. The package of claim 57, wherein the first package is shaped differently
than the second package.

10 61. The package of claim 57, wherein the first package includes a tray.

62. The package of claim 61, wherein the tray is comprised of polystyrene
foam.

15 63. The package of claim 62, wherein the tray includes a bottom wall, a
continuous side wall, and a continuous rim, the continuous side wall encompassing the
bottom wall and extending upwardly and outwardly from the bottom wall, the
continuous rim encompassing an upper edge of the continuous side wall and projecting
generally laterally outwardly therefrom.

20 64. The package of claim 57, wherein the non-barrier portion is a stretch
film.

25 65. The package of claim 64, wherein the stretch film comprises a
polyolefin or polyvinyl chloride.

66. The package of claim 57, wherein the first package is substantially free
of oxygen therein in response to the first package being flushed with the one or more
gases.

30 67. The package of claim 57, wherein the second package is a polymeric

bag.

68. The package of claim 57, wherein the gas mixture comprises from about 0.3 to about 0.5 vol.% carbon monoxide.

5

69. The package of claim 57, wherein the gas mixture comprises from about 0.1 to about 0.5 vol.% carbon monoxide.

70. A modified atmosphere package comprising first and second compartments separated by a partition member, the partition member including a non-barrier portion substantially permeable to oxygen, the first and second compartments being encompassed by an outer wall substantially impermeable to oxygen, the second compartment being configured and sized to fully enclose a retail cut of raw meat, and the first compartment containing a mixture of gases, the gas mixture comprising from about 0.1 to about 0.8 vol.% carbon monoxide and at least one other gas to form a low oxygen environment so as to form carboxymyoglobin on a surface of the meat.

10 71. The package of claim 70 further including an oxygen scavenger.

20 72. The package of claim 70, wherein the second compartment package includes a tray.

73. The package of claim 72, wherein the tray is comprised of polystyrene foam.

25

74. The package of claim 70, wherein the gas mixture comprises from about 0.3 vol.% to about 0.5 vol.% carbon monoxide.

30 75. The package of claim 70, wherein the gas mixture comprises from about 0.1 vol.% to about 0.5 vol.% carbon monoxide.

76. A modified atmosphere package, comprising.
a package being configured and sized to fully enclose a retail cut of raw meat,
the package having a mixture of gases comprising from about 0.1 to
about 0.8 vol.% carbon monoxide and at least one other gas to form a
5 low oxygen environment so as to form carboxymyoglobin on a surface
of the raw meat;
a first layer having at least a portion being substantially permeable to oxygen
and sealed to the package; and
a second layer being substantially impermeable to oxygen and sealed to at least
10 one of the package and the first layer.

77. The package of claim 76, wherein a pocket is formed between the first
layer and the second layer.

15 78. The package of claim 76, wherein the second layer is at least sealed to
the first layer and the second layer is adapted to be peelable from the first layer.

20 79. The package of claim 76, wherein the package includes a bottom wall, a
continuous side wall, and a continuous rim, the continuous side wall encompassing the
bottom wall and extending upwardly and outwardly from the bottom wall, the
continuous rim encompassing an upper edge of the continuous side wall and projecting
laterally outwardly therefrom.

25 80. The package of claim 76 further including supplying an oxygen
scavenger.

81. The package of claim 76, wherein the oxygen level in the package is
less than 1,000 ppm.

30 82. The package of claim 81, wherein the oxygen level in the package is
less than about 500 ppm.

83. The package of claim 76, wherein the gas mixture consists essentially of from about 0.1 to about 0.8 vol.% carbon monoxide, from about 40 to about 80 vol.% nitrogen and from about 20 to about 60 vol.% carbon dioxide.

5

84. The package of claim 77, wherein the package further includes a foam tray sized to hold the meat.

85. The package of claim 77, wherein the gas mixture comprises from
10 about 0.3 to about 0.5 vol.% carbon monoxide.

86. The package of claim 77, wherein the gas mixture comprises from about 0.1 to about 0.5 vol.% carbon monoxide.